

# EXHIBIT 1



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/008,359	12/04/2006	6472128		8757

53884 7590 04/09/2007

ROHM AND HAAS ELECTRONIC MATERIALS LLC  
455 FOREST STREET  
MARLBOROUGH, MA 01752

EXAMINER

*Stephen J. Stein* *ms*

ART UNIT PAPER NUMBER

*3991 IFW*

DATE MAILED: 04/09/2007

Please find below and/or attached an Office communication concerning this application or proceeding.



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NEW YORK, NY 10036

**EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM**

REEXAMINATION CONTROL NO. 90/008,359.

PATENT NO. 6472128.

ART UNIT 3991.

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

<b>Office Action in Ex Parte Reexamination</b>	Control No. 90/008,359	Patent Under Reexamination 6472128	
	Examiner Stephen J. Stein	Art Unit 3991	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

- a ☒ Responsive to the communication(s) filed on 04 December 2006.      b ☐ This action is made FINAL.  
c ☒ A statement under 37 CFR 1.530 has not been received from the patent owner.

A shortened statutory period for response to this action is set to expire 2 month(s) from the mailing date of this letter. Failure to respond within the period for response will result in termination of the proceeding and issuance of an *ex parte* reexamination certificate in accordance with this action. 37 CFR 1.550(d). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).** If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

**Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:**

- |   |   |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 3. <input type="checkbox"/> Interview Summary, PTO-474. |
| 2. <input type="checkbox"/> Information Disclosure Statement, PTO/SB/08.                | 4. <input type="checkbox"/> _____.                      |

**Part II SUMMARY OF ACTION**

- 1a. ☒ Claims 1-16 are subject to reexamination.  
1b. ☐ Claims \_\_\_\_\_ are not subject to reexamination.  
2. ☐ Claims \_\_\_\_\_ have been canceled in the present reexamination proceeding.  
3. ☐ Claims \_\_\_\_\_ are patentable and/or confirmed.  
4. ☒ Claims 1-16 are rejected.  
5. ☐ Claims \_\_\_\_\_ are objected to.  
6. ☐ The drawings, filed on \_\_\_\_\_ are acceptable.  
7. ☐ The proposed drawing correction, filed on \_\_\_\_\_ has been (7a) ☐ approved (7b) ☐ disapproved.  
8. ☐ Acknowledgment is made of the priority claim under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of the certified copies have  
1 ☐ been received.  
2 ☐ not been received.  
3 ☐ been filed in Application No. \_\_\_\_\_.  
4 ☐ been filed in reexamination Control No. \_\_\_\_\_.  
5 ☐ been received by the International Bureau in PCT application No. \_\_\_\_\_.  
\* See the attached detailed Office action for a list of the certified copies not received.  
9. ☐ Since the proceeding appears to be in condition for issuance of an *ex parte* reexamination certificate except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte* Quayle, 1935 C.D. 11, 453 O.G. 213.  
10. ☐ Other: \_\_\_\_\_

cc: Requester (if third party requester)

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### ***Reexamination***

1. This is the first Office action in the Reexamination proceeding of Claims 1-16 of U.S. 6,472,128 issued on October 29, 2002 to Thackeray et al. ('128 patent). The application on which the patent was granted, 09/924,045, was filed on August 7, 2001 and is a continuation of 08/650,144, now US patent 6,451,504, filed April 30, 1996 and which is a continuation of U.S. 07/792,482, now U.S. 6,165,697, filed November 15, 1999. The earliest effective filing date of the patent is November 15, 1999.

### ***Procedural Posture***

2. A request for Reexamination was filed on December 4, 2006 by the third party Requester. An order for reexamination was granted on January 25, 2007. The patent owner has not filed a statement under 37 CFR 1.530.

### ***Representative Claims***

Claim 1. A coated substrate comprising:  
a substrate having thereon:  
a coating layer of an antireflective composition, the antireflective composition comprising a crosslinker and an anthracene material; and  
a coating layer of a photoresist composition over the antireflective composition coating layer.

Claim 5. A method for forming a relief image on a substrate comprising:  
applying on the substrate a layer of an antihalation composition comprising an anthracene material; and  
applying over the antihalation composition coating layer a photoresist composition.

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Claim 1 and 5 are independent claims. Claims 2-4 depend from claim 1 and claims 6-16 depend from claim 5.

### ***Double Patenting***

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 7, 11, 12 and 15 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 9 and 28 of U.S. Patent No. 5,851,738. Although the conflicting claims are not identical, they are not patentably distinct from each other because while the '128 patent does not explicitly claim that the photoresist composition layer comprises a resin binder and a radiation sensitive component, it would have been obvious to a person of ordinary skill in the art to make the photoresist layer of the '128 patent comprise both a resin binder and a radiation sensitive component since such photoresist compositions were known to be

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conventionally made of novalak resins and light sensitive quinone compounds (radiation sensitive components) (See for example U.S. 4,943,511 and U.S. 4,863,829).

***Claim Rejections - 35 USC § 102***

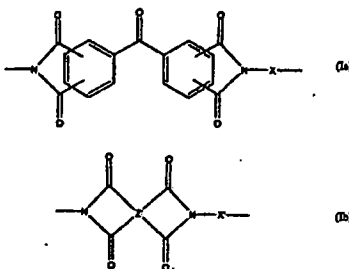
5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. **Claims 1-5 and 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,935,320 (Rhode).**

Regarding claim 1, Rhode discloses a coated material comprising (1) a substrate that can bear a relief image, (2) a photostructable negative working adhesive layer made of polyimide homo- and co-polymers, and (3) a self-supporting photocrosslinkable film (photoresist layer) (See column 4, lines 10-15 and column 11, lines 25-32). Rhode further teaches that the adhesive layer may contain anti-halo dyes additives (an additive which provides antireflective and antihalation properties) (See column 31, lines 5-12 and column 11, lines 27-51). Rhodes further teaches that the polyimide homo- and co-polymers which are useful in the both the adhesive layer and photocrosslinkable film layer are formed from repeating units of formula (Ia) and (Ib): (See column 11, lines 27-54).



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In these formulas, X and X' are the same or different divalent radicals of aromatic diamines, and Z' is a tetravalent aromatic radical (See column. 4, lines 59-62) and Z' is preferably one of five aromatic moieties, one of which is anthracene. Rhode also describes other anthracene-containing copolymers, represented by formula (II) and (III) (See column 11 lines 43-68). The anthracene embodiments of these formulas are specifically described at column 26, line 36 - column 27, line 49). Rhode further discloses that the polyamide polymer class of adhesives may include an organic chromophoric polyazide (an azide crosslinker) (See column 13, lines 13-27).

**Regarding claim 2**, as stated above, Rhode discloses that the adhesive layer may include a crosslinker as well as resins. Rhode further discloses that the coated material is exposed to light (See columns 1 and 2). Such cross-linkers will inherently crosslink with the resins contained in adhesive layer when exposed to light or heat.

**Regarding claim 3**, Rhode discloses that the adhesive layer may include copper onium salt (a thermal acid generator) (See column 16, lines 45-67).

**Regarding claim 4**, Rhode discloses that the antireflective layer may be placed over silicon wafer substrates (microelectronic wafer substrate) (See column 33, lines 17-18).

**Regarding claim 5**, as stated above, Rhode discloses applying an adhesive layer comprising anti-halo dyes and an anthracene containing polymers (anti-halation layer), on a substrate and applying a self-supporting photocrosslinkable film (photoresist layer) over the adhesive layer (See column 11, lines 28-68, column 26, lines 36-53, column 32, lines 37-48).



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**Regarding claim 11**, as stated above, Rhode discloses that the antihalation adhesive layer comprises copper onium salts (thermal acid generators) (See column, 16, lines 51-53).

**Regarding claim 12**, Rhode discloses that the antireflective layer may be placed over silicon wafer substrates (microelectronic wafer substrate) (See column 33, lines 17-18).

**Regarding claim 13**, Rhode discloses exposing a substrate coated with an antihalation adhesive layer and a photoresist layer to actinic radiation and thereafter developing them with developer to produce a relief image on the photoresist layer (See column 32, lines 32-48).

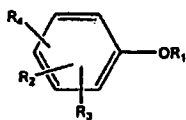
**7. Claims 1, 2 and 4-8, 12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,863,827 (Jain).**

**Regarding claim 1**, Jain discloses a process for forming a multilevel photosensitive element consisting of a substrate coated with a first a layer and a second photosensitive layer (photoresist layer) (See abstract and column 17, lines 51-48 and column 18, lines 64-68). The first photosensitive layer is formed using an alkali soluble resins such as novalak or polyvinyl phenol resin, an o-quinonediazide compound, and an acid catalyzed cross-linker compound (See column 16, line 49 - column 17, line 30). The quinonediazides included in the first photosensitive composition layer are represented by the structure:

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wherein R<sub>1</sub>= 1,2-benzoquinone-2-diazide-4-sulfonyl; 1,2-naphthoquinone-2-diazide-4-sulfonyl; or 1,2-anthraquinone-2-diazide-4-sulfonyl (anthracene compounds) (See column 10, lines 2-27). When these diazides are exposed to actinic radiation, they generate an acid that catalyzes a crosslinking reaction between the alkali soluble resin and the crosslinker compound (See column 5, lines 1-7). The degree of crosslinking may be controlled by adjusting the dosage and temperature of the post-exposure bake, but if no post-exposure bake is used, the first photoresist layer behaves as a conventional positive resist (See column 2, lines 53-68). Jain still further discloses that additives such as organic dyes and adhesion promoters may be added to the first photosensitive layer before it is coated on the substrate and that dyes help provide increased resolution by inhibiting the back scattering of light off the substrate so that the first photosensitive layer is thereby rendered. Thus, the first photosensitive layer is a layer with antihalation and antireflective properties (See column 17, lines 59-64 and column. 18, lines 4-6).

**Regarding claim 2**, as stated above, Jain discloses that the first layer contains crosslinkers (See column 16, lines 49-53, column 4, lines 17-19 and example 1).

**Regarding claim 4**, Jain discloses that the first layer is place over a silicon wafer (microelectronic substrate) (See column 31, line 32).

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**Regarding claim 5**, as discussed above, Jain discloses a process of applying antihalation compositions, including antihalation/antireflective layers containing anthracene materials, on a silicon substrate, and also discloses applying photoresist over the layer (See column 18, lines 4-6, column 10, lines 2-27 and column 1, lines 67-68).

**Regarding claim 6**, as stated above, Jain discloses crosslinking the antihalation layer prior to applying the photoresist layer (See column 4, lines 17-19 and Example 1).

**Regarding claim 7**, Jain discloses exposing the first photosensitive composition (antihalation layer) to actinic radiation through an image mask and developing to remove the exposed portion of said first photosensitive composition (See column 5, lines 29-32).

**Regarding claim 8**, Jain discloses removing the exposed portion of said first photosensitive composition (etching) (See column 5, lines 29-32).

**Regarding claim 12**, Jain discloses that the first layer is place over silicon wafer (a microelectronic wafer) (See column 31, line 32).

**Regarding claim 13**, Jain discloses exposing that the first photosensitive composition (antihalation layer) to actinic radiation (activating radiation) through an image mask and developing (treated with a developer) to remove the exposed portion of said first photosensitive composition (See column 5, lines 29-32).

**8. Claims 5 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 3,888,702 (Koshimo).**

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**Regarding claim 5**, Koshimo discloses a substrate for electronic materials (a microelectronic wafer) coated with an adhesive layer and a polyamide photoresist layer of the adhesive (See column 8, lines 10-17 and column 9, lines 62-64). Koshimo further discloses that "[i]t is desirable, therefore, to provide a light-absorbing layer or antihalation layer between the photosensitive polyamide layer and support layer. A dispersion or solution of a suitable dye or pigment in a resin having adherence to the support may be used to provide such a layer" and that the disclosed antihalation layer comprises a resin binder and a suitable dye, such as an anthroquinone dye like anthroquinone violet (anthracene compound) (See column 8, Lines 59-67).

**Regarding claim 12**, as stated above, Koshimo discloses that the coating may be used on electronic materials (microelectronic substrates) (See column 9, lines 62-64).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. **Claims 5 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 4,910,122 (Arnold) in view of U.S. Patent 3,888,702 (Koshimo).**

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**Regarding claim 5**, Arnold discloses antihalation/antireflective compositions comprising a polymeric resin, such as a polyimide resin (See column 2, lines 19-27), and an organic dye to absorb reflected light resulting from the exposure of an over coated photoresist layer (See column 4, lines 26-28). Arnold states that many dyes can be used in the disclosed invention, and that the dye should be selected to absorb at the wavelength of the radiation used to expose the photoresist (See column 4, lines 26-28). Arnold still further discloses spin-coating the antihalation composition on a silicon wafer, applying a layer of photoresist over the antihalation composition, exposing the resulting coated substrate to activating radiation, developing the exposed photoresist, then etching the coated substrate using an oxygen plasma (See column 4, lines 39-57; examples 1 and 2, col. 5, lines 1-55). Arnold does not specifically disclose the use of an anthracene in the antireflective layer.

Koshimo discloses a substrate for electronic materials coated with an adhesive layer and a polyamide photoresist layer of the adhesive (See column 8, lines 10-17 and column 9, lines 62-64-64). Koshimo further discloses that "[i]t is desirable, therefore, to provide a light-absorbing layer or antihalation layer between the photosensitive polyamide layer and support layer. A dispersion or solution of a suitable dye or pigment in a resin having adherence to the support may be used to provide such a layer" and that the disclosed antihalation layer comprises a resin binder and a suitable dye, such as an anthroquinone dye like anthroquinone violet (anthracene compound) (See column 8, Lines 59-67).

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Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use an anthracene compound such as anthroquinone dye as a disclosed by Koshimo for the radiation absorbing organic dye material of Arnold because it is disclosed to be a suitable dye for use in an equivalent light absorbing (anti-reflective) layer.

**Regarding claim 12**, as stated above, Arnold discloses spin-coating the antihalation composition on a silicon wafer (microelectronic wafer) (See column 4, lines 39-57; examples 1 and 2, col. 5, lines 1-55).

**Regarding claim 13**, Arnold discloses exposing the photoresist layer to light of the known required wavelengths (activating radiation) and then developing with a photoresist developer (See column 4, lines 39-57; examples 1 and 2, col. 5, lines 1-55).

**Regarding claim 14**, Arnold discloses that the photoresist may be removed with a short plasma etch cycle (See column 4, lines 49-57).

**Regarding claim 15**, Arnold discloses that the plasma etching of the photoresist may be performed with oxygen plasma (a plasma gas) (See column 4, lines 49-57).

**Regarding claim 16**, Arnold discloses that both the photoresist layer and the underlying film (the antihalation/antireflective layer) may be removed with a short plasma etch cycle (See column 4, lines 49-54). Thus, the antihalation layer must necessarily be penetrated by the oxygen plasma gas.

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**11. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,863,827 (Jain) as applied to claim 7 above and further in view of U.S. 4,910,122 (Arnold).**

Regarding claim 9, as stated above, Jain discloses a process for forming a multilevel photosensitive element consisting of a substrate coated with a first photosensitive layer comprising anthracene and having antihalation properties and a photoresist layer over the photosensitive layer. Jain further discloses that the photosensitive antihalation layer is cross-linked layer prior to applying the photoresist layer and then the photoresist is subsequently exposed to actinic radiation through an image mask and developed (treated with a developer) to remove the exposed portion of the first photosensitive composition. Jain does not specifically disclose that that the areas bared of photoresist are upon treatment with the developer, exposed to plasma gas.

Arnold discloses a process of coating antihalation compositions on a substrate and applying a layer of photoresist over the antihalation composition, followed by (1) exposing the resulting coated substrate to activating radiation, (2) developing the exposed photoresist, and (3) etching the coated substrate using an oxygen plasma (a plasma gas)(See column 4, lines 49-57). Arnold further discloses that using a dry etch process, such as a plasma etching process, allows the vehicle (portions of the antihalation layer) to be rapidly removed (See column 3, lines 48-53).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use oxygen plasma (a plasma gas) as disclosed by Arnold as the

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etchant for removing the developed areas of the antihalation layer of Jain since dry etching techniques such as oxygen plasma etching are disclosed to be a rapid method of etching during manufacture.

**Regarding claim 10**, Arnold discloses that both the photoresist layer and the underlying film (the antihalation/antireflective layer) may be removed with a short plasma etch cycle (See column 4, lines 49-54). Thus, the antihalation layer must necessarily be penetrated by the oxygen plasma gas.

### ***Conclusion***

12. Claims 1-16 are rejected.

### ***Litigation Reminder***

13. The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent No. 6,472,128 throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly appraise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.



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***Future Correspondence***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Stein whose telephone number is 571-272-1544. The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 5:00 p.m. If the attempts to reach the examiner are unsuccessful, the examiner's supervisor, Deborah Jones can be reached by dialing 571-272-1535. The official fax number for the organization where this application is assigned is 571-273-9900.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**All correspondence relating to this *ex parte* reexamination proceeding should be directed as follows:**

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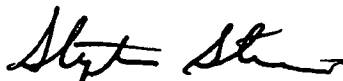
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Alexandria, VA 22314


April 6, 2007



Stephen J. Stein  
Primary Examiner  
Art Unit 3991

KILEY STONER  
CRU EXAMINER-AU 3991

Conferee  \_\_\_\_\_

Conferee  \_\_\_\_\_

DEBORAH D. JONES  
SPRE-AU 3991  
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# EXHIBIT 2

9

Receipt Postcard

April 19, 2007

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The following was/were received in the U.S. Patent and Trademark Office on the date stamped hereon:

- ☐ Change of Address - Constance Huthner
- ☒ ☐ ☐ ☐ ☐ ☐

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- ☐ Charge \$\_\_\_\_\_ to credit card. Form PTO-2038 is attached
- ☐ Filed by Certificate of Mail
- ☐ ☐ ☐ ☐ ☐ ☐



# EXHIBIT 3

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<b>Suffix</b>	
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<b>Primary Telephone</b>	(212) 440-4426
<b>Registration Number</b>	35903
<b>Attorney/Agent</b>	ATTORNEY
<b>Date Registered as Attorney</b>	10/06/1992

# EXHIBIT 4



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53884 7590 07/12/2007

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MARLBOROUGH, MA 01752

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<b>Ex Parte Reexamination Interview Summary</b>	<b>Control No.</b>	<b>Patent Under Reexamination</b>	
	90/008,359	6472128	
	<b>Examiner</b>	<b>Art Unit</b>	
	Stephen J. Stein	3991	

All participants (USPTO personnel, patent owner, patent owner's representative):

- (1) Stephen J. Stein (Examiner) (3) Peter Corliss (Patent Owner's Representative)  
 (2) Dwayne Jones (Examiner) (4) Jim Thackeray (Inventor)

Date of Interview: 12 July 2007

Type: a) ☐ Telephonic b) ☐ Video Conference  
 c) ☒ Personal (copy given to: 1) ☐ patent owner 2) ☒ patent owner's representative)

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.  
 If Yes, brief description: \_\_\_\_\_

Agreement with respect to the claims f) ☐ was reached. g) ☐ was not reached. h) ☒ N/A.  
 Any other agreement(s) are set forth below under "Description of the general nature of what was agreed to..."

Claim(s) discussed: Amended claims 1-16 and proposed new claims.


Identification of prior art discussed: U.S. 4,863,827 (Jain), U.S. 3,884,702 (Koshimo), U.S. 4,935,320 (Rohde).

Description of the general nature of what was agreed to if an agreement was reached, or any other comments:  
See Continuation Sheet.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims patentable, if available, must be attached. Also, where no copy of the amendments that would render the claims patentable is available, a summary thereof must be attached.)

**A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION MUST INCLUDE PATENT OWNER'S STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. (See MPEP § 2281). IF A RESPONSE TO THE LAST OFFICE ACTION HAS ALREADY BEEN FILED, THEN PATENT OWNER IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO PROVIDE THE MANDATORY STATEMENT OF THE SUBSTANCE OF THE INTERVIEW (37 CFR 1.560(b)). THE REQUIREMENT FOR PATENT OWNER'S STATEMENT CAN NOT BE WAIVED. EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).**

cc: Requester (if third party requester)

  
 Examiner's signature, if required

Continuation Sheet (PTOL-474)

Reexam Control No. 90/008,359

Continuation of Description of the general nature of what was agreed to if an agreement was reached, or any other comments:

Patent owner requested an interview after filing of an amendment to discuss the amendment and prior art. With regard to the Koshimo and Jain prior art references, patent owner argued that while the references disclosed anthroquinone compounds in the anti-reflective layers, the references did not disclose anthracene. Patent owner further pointed out that anthroquinone is not the same as anthracene. With regard to the Rohde prior art reference, patent owner argued that the Rohde taught only negative acting polyimide while patent owners amended independent claims 1 and 5 require a positive-acting photoresist. Patent owner stated that they would provide evidence to the lack of or difficulty in having positive acting photolithographic polyimides. It was further argued that new independent claim 24 was patentably distinct from Rohde since Rohde disclosed exposing the photolithographic polyimide in the 340nm plus area of the spectrum, while claim 24 requires exposing the photoresist at 248nm. Patent owner finally proposed amending new independent claim 28, to specify that the crosslinking step of the antihalation layer occurs prior to applying the photoresist layer. It was argued that this method was patentably distinct from the method described in Rohde, since in Rohde the cross-linking step occurs after the polyimide film is applied. Patent owner agreed to file this amendment in supplemental amendment and to further flush out the arguments. No agreement to patentability of any of the claims was agreed to.

# EXHIBIT 5

REDACTED

# EXHIBIT 6

REDACTED

# EXHIBIT 7



REDACTED

# EXHIBIT 8

In re Application:  
Thackeray et al.

Application No.: 90/008,359

Confirmation No.: 8757

Filed: December 4, 2006

Art Unit: 3991

For: ANTIHALATION COMPOSITIONS

Examiner: S. Stein

CERTIFICATE OF SERVICE

I, Peter F. Corless hereby certify that in connection with the above-identified application copies of the following filed with the U.S. Patent and Trademark Office on July 19, 2007:

Supplemental Amendment  
Amendment Transmittal Letter

are being deposited with the United States Postal Service on July 19, 2007, in an envelope with first class postage addressed to:

Constance S. Huttner  
Skadden Arps Slate Meagher & Flom LLP  
Four Times Square  
New York, New York 10036



Peter F. Corless (Reg. 33860)  
EDWARDS, ANGELL, PALMER & DODGE LLP  
P.O. Box 55874  
Boston, MA 02205  
(617) 439-4444

PTO/SB/97 (09-04)

Approved for use through 07/31/2008. OMB 0651-0031

U. S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Application No. (if known): 09/924,045

Attorney Docket No.: 406785C(70329)

## Certificate of Transmission under 37 CFR 1.8

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office.

on July 19, 2007  
Date



Signature

Peter F. Corless

Typed or printed name of person signing Certificate

33,860

Registration Number, if applicable

(617) 517-5557

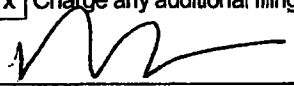

Telephone Number

Note: Each paper must have its own certificate of transmission, or this certificate must identify each submitted paper.

Supplemental Amendment (8 pages)

Amendment Transmittal (1 page)

Copy of Certificate of Service (1 page)

<b>AMENDMENT TRANSMITTAL LETTER</b>				Docket No. 40678-5C(70329)	
Application No. 90/008,359-Conf. #8757		Filing Date December 4, 2006		Examiner S. J. Stein	
				Art Unit 3991	
Applicant(s): James W. Thackeray					
Invention: ANTIHALATION COMPOSITIONS					
<b>TO THE COMMISSIONER FOR PATENTS</b>					
Transmitted herewith is an amendment in the above-identified application.					
The fee has been calculated and is transmitted as shown below.					
<b>CLAIMS AS AMENDED</b>					
	Claims Remaining After Amendment	Highest Number Previously Paid	Number Extra Claims Present	Rate	
<b>Total Claims</b>	0	- 20 =	0	x 50.00	0.00
<b>Independent Claims</b>	0	- 3 =	0	x 200.00	0.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					
Other fee (please specify):					
<b>TOTAL ADDITIONAL FEE FOR THIS AMENDMENT:</b>					0.00
<input checked="" type="checkbox"/> Large Entity <span style="margin-left: 200px;"><input type="checkbox"/> Small Entity</span>					
<input checked="" type="checkbox"/> No additional fee is required for this amendment.					
<input type="checkbox"/> Please charge Deposit Account No. _____ in the amount of \$ _____. A duplicate copy of this sheet is enclosed.					
<input type="checkbox"/> A check in the amount of \$ _____ to cover the filing fee is enclosed.					
<input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.					
<input checked="" type="checkbox"/> The Director is hereby authorized to charge and credit Deposit Account No. <u>04-1105</u> as described below. A duplicate copy of this sheet is enclosed.					
<input checked="" type="checkbox"/> Credit any overpayment.					
<input checked="" type="checkbox"/> Charge any additional filing or application processing fees required under 37 CFR 1.16 and 1.17.					
 Peter F. Corless Attorney/Agent Reg. No.: 33,860  EDWARDS ANGELL PALMER & DODGE LLP P.O. Box 55874 Boston, Massachusetts 02205 (617) 517-5557				Dated: <u>July 19, 2007</u>	
I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted by facsimile to the Patent and Trademark Office, facsimile no. (571) 273-8300, on the date shown below. Dated: July 19, 2007      Signature:  (Peter F. Corless)					

Docket No.: 40678-5C  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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In re Application:  
Thackeray et al.

Application No.: 90/008,359

Confirmation No.: 8757

Filed: December 4, 2006

Art Unit: 3991

For: ANTIHALATION COMPOSITIONS

Examiner: S. Stein

**SUPPLEMENTAL AMENDMENT**

MS *Ex Parte* Reexam  
ATTN: Central Reexamination Unit  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

**INTRODUCTORY COMMENTS**

On June 11, 2007, Applicants file a response to the Office Action mailed from the United States Patent and Trademark Office on April 9, 2007 in the above-identified application.

By the present Supplemental Amendment, Applicants supplement that response of June 11.

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Remarks** begin on page 6 of this paper.

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**Amendments to the Claims**

(currently amended) Claim 1. A coated substrate comprising:  
a substrate having thereon:  
a coating layer of an antireflective composition, the antireflective composition comprising a crosslinker and an anthracene material; and  
a coating layer of a positive-acting photoresist composition over the antireflective composition coating layer.

(original) Claim 2. The substrate of claim 1 wherein the antireflective composition coating layer is crosslinked.

(original) Claim 3. The substrate of claim 1 wherein the antireflective composition comprises a thermal acid generator.

(original) Claim 4. The substrate of claim 1 wherein the substrate is a microelectronic wafer.

(currently amended) Claim 5. A method for forming a relief image on a substrate comprising:  
applying on the substrate a layer of an antihalation composition comprising an anthracene material;  
applying over the antihalation composition coating layer a positive-acting photoresist composition.

(original) Claim 6. The method of claim 5 wherein the antihalation composition coating layer is crosslinked prior to applying the photoresist composition.

(original) Claim 7. The method of claim 6 wherein the photoresist composition is imaged with activating radiation and the imaged photoresist composition is treated

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with a developer to provide a photoresist relief image.

(original) Claim 8. The method of claim 7 wherein areas bared of photoresist upon treatment with the developer are etched.

(original) Claim 9. The method of claim 7 wherein areas bared of photoresist upon treatment with the developer are exposed to a plasma gas.

(original) Claim 10. The method of claim 9 wherein the plasma gas penetrates the antihalation composition coating layer.

(original) Claim 11. The method of claim 5 wherein the antihalation composition comprises a thermal acid generator.

(original) Claim 12. The method of claim 5 wherein the substrate is a microelectronic wafer.

(original) Claim 13. The method of claim 5 wherein the photoresist composition is imaged with activating radiation and the imaged photoresist composition is treated with a developer to provide a photoresist relief image.

(original) Claim 14. The method of claim 13 wherein areas bared of photoresist upon treatment with the developer are etched.

(original) Claim 15. The method of claim 13 wherein areas bared of photoresist upon treatment with the developer are exposed to a plasma gas.

(original) Claim 16. The method of claim 15 wherein the plasma gas penetrates the antihalation composition coating layer.

(new) Claim 17. The method of claim 6 wherein the photoresist composition is imaged with radiation having a wavelength of 100 nm to 300 nm.



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(new) Claim 18. The method of claim 6 wherein the photoresist composition is imaged with radiation having a wavelength of 248 nm.

(new) Claim 19. The method of claim 7 wherein the photoresist layer is imaged with radiation having a wavelength of 100 to 300 nm.

(new) Claim 20. The method of claim 7 wherein the photoresist layer is imaged with radiation having a wavelength of 248 nm.

(new) Claim 21. The method of claim 5 wherein the photoresist composition is a chemically amplified positive-acting photoresist composition.

(new) Claim 22. The method of claim 18 wherein the photoresist composition is a chemically amplified positive-acting photoresist composition.

(new) Claim 23. The substrate of claim 1 wherein the photoresist composition is a chemically amplified positive-acting photoresist composition.

(new) Claim 24. A method for forming a relief image on a substrate comprising:

applying on the substrate a layer of an antihalation composition comprising an anthracene material;

applying over the antihalation composition coating layer a photoresist composition; and

exposing the applied photoresist composition to patterned radiation having a wavelength of 248 nm.

(new) Claim 25. The method of claim 25 wherein the antihalation composition is crosslinked prior to applying the photoresist composition over the antihalation composition layer.

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(new) Claim 26. The method of claim 24 wherein the photoresist composition is a chemically-amplified positive-acting photoresist composition.

(new) Claim 27. The method of claim 25 wherein the photoresist composition is a chemically-amplified positive-acting photoresist composition.

(new) Claim 28. A method for forming a relief image on a substrate comprising:  
applying on the substrate a layer of an antihalation composition comprising an anthracene material;  
crosslinking the antihalation composition layer; and  
applying over the crosslinked antihalation composition coating layer a photoresist composition.

(new) Claim 29. The method of claim 28 further comprising imaging the photoresist composition with activating radiation and treating the imaged photoresist composition with a developer to provide a photoresist relief image.

(new) Claim 30. The method of claim 29 wherein areas bared of photoresist upon treatment with the developer are etched.

(new) Claim 31. The method of claim 29 wherein areas bared of photoresist upon treatment with the developer are exposed to a plasma gas.

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### **REMARKS**

Claims 1-31 are pending herein. Claim 28 has been amended to add "crosslinked" antihalation layer and thus recites "applying over the crosslinked antihalation composition coating layer a photoresist composition." No new matter has been added by that amendment. For instance, support for the amendment appears e.g. in the original claims of the application.

#### **Patent Owner's Statement of Interview:**

The undersigned and Dr. Thackeray appreciate the time and helpful comments provided by Examiners Stein and Jones during the interview on July 12, 2007. At that time, the amendment of claim 28 as made herein was discussed to provide further clarity. The Rhode document also was discussed. The Examiners agreed that U.S. Patent 4,863,827 (Jain) and U.S. Patent 3,884,702 (Koshimo) do not disclose anthracene materials.

#### **Supplemental Response:**

Claims 1-5 and 11-14 were rejected under 35 U.S.C. 102 over Rhode (U.S. Patent 4,935,320). The rejection is traversed.

Claims 1 and 5 (the only rejected independent claims) each calls for a "positive-acting photoresist."

The Rhode document does not describe use of positive photoresists. Rather, the Rhode document reports use of a negative composition only. See, for instance, column 32 of Rhode.

Indeed, it has been recognized that polyimide compositions are more typically employed as negative-acting compositions. Enclosed is a copy of an article "HD Micro Puts Out Positive Polyimide," Electronic News (June 19, 200), which states "Virtually all the polyimides (before now) have been negative tone polyimides ...."

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The Rhode document also does not teach or suggest subject matters of the new claims.

For instance, new independent claim 24 recites "exposing the applied photoresist composition to patterned radiation having a wavelength of 248 nm." The Rhode document reports higher exposure wavelengths. See Rhode at column 2, lines 50-53.

New independent claim 28 recites "crosslinking the antihalation composition layer; and applying over the crosslinked antihalation composition coating layer a photoresist composition." Such crosslinking and application of a photoresist composition is not disclosed in Rhode.

Accordingly, the rejection is properly withdrawn. See *In re Marshall*, 198 USPQ 344, 346 (CCPA 1978) ("[r]ejections under 35 U.S.C. §102 are proper only when the claimed subject matter is identically disclosed or described in the prior art.").

It is believed the application is in condition for immediate allowance, which action is earnestly solicited.

Respectfully submitted,

By 

Peter F. Corless

Registration No.: 33,860

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Attorneys/Agents For Applicant

## HD Micro Puts Out Positive Polyimide

— 6/19/2000

Electronic News

HD Microsystems LLC said it has developed a **positive photodefinable polyimide** that will save chipmakers process costs and mask steps.

HD Micro, a joint venture between DuPont Co. and Hitachi Chemical Co. Ltd., introduced its **HD-8000 polyimide** developed for single mask, stress buffer passivation applications such as DRAMs, SRAMs, logic devices and microprocessors. The polyimide layer is applied to a wafer on top of the final passivation layer in the last production step before back grinding, dicing and packaging.

"All of the DRAM manufacturers use the overcoat technology for protection," noted Ioan Matthews, a chief scientist for HD Micro. About half of logic device manufacturers currently utilize a polyimide layer, he said.

"Virtually all of the polyimides (before now) have been negative tone polyimides," Matthews said. Since chipmakers moved to positive, as opposed to negative, resists in the 1980s, this has meant an extra set of mask steps is necessary to apply a final polyimide layer to a wafer. "With DH-8000, they can use the masks they've already created," Matthews said.

"The negative tone systems out there require solvent developers, and that requires a special, additional track," added Craig Schuckert, global product manager for HD Micro. With the positive tone HD-8000, which doesn't contain NMP, a chemical commonly found in polyimides that is not compatible with deep-ultraviolet resists, maintaining a separate track and the associated disposal steps are not longer necessary, Schuckert said.

HD-8000 can be processed in fabs using both deep-ultraviolet and I-line photoresists, according to HD Micro. The company said that with an aspect ratio of two to one, HD-8000 is capable of imaging 4 micron features in 8 micron cured films, making it ideal for use as a silicon nitride etch dry mask. HD-8000 has a cure cycle of 90 minutes, a glass transition temperature of 300 degrees Celsius and a cured film thickness range of 5 to 10 microns. It can be patterned with both I-line and G-line steppers. HD Micro expects to begin shipment of the new polyimide in the third quarter of this year.

# EXHIBIT 9

REDACTED